We claim:

1. A discontinuous buffer gel electrophoresis system comprising:

an electrophoresis gel suitable for casting, the electrophoresis gel uniformly saturated with a gel buffer comprising an organic amine with a pK_a near neutrality and an acid, the gel buffer having a pH between 5.5 and 7.5; and

a cathode buffer comprising an antioxidant that is anionic at neutral pH in a concentration sufficient to maintain proteins in a reduced state.

2. The system of claim 1, wherein the organic amine is Bis(2-hydroxyethyl) iminotris (hydroxymethyl) methane.

3. The system of claim 1, wherein the electrophoresis gel is a polyacrylamide gel.

4. The system of claim 1, wherein the acid is selected from the group consisting of hydrochloric acid and acetic acid.

5. The system of claim 1, wherein the antioxidant comprises sulfite.

6. The system of claim 1, wherein the antioxidant comprises bisulfite.

7. The system of claim 1, wherein the antioxidant comprises a thiol.

8. The system of claim 1, wherein the antioxidant comprises thioglycolic acid.

9. The system of claim 1, wherein the gel buffer further comprises a dodecyl-sulfate salt.

10. The system of claim 9, wherein the dodecyl-sulfate salt is sodium dodecyl sulfate.

11. The system of claim 1, wherein the cathode buffer further comprises 3-(N-morpholino) propanesulfonic acid.

12. The system of claim 1, wherein the cathode buffer further comprises 2-(N-morpholino) ethanesulfonic acid.

13. A discontinuous buffer gel electrophoresis system comprising:

an electrophoresis gel suitable for casting, the electrophoresis gel uniformly saturated with a gel buffer comprising an organic amine with a pK_a near neutrality and an acid, the gel buffer having a pH between 5.5 and 7.5; and

a cathode buffer comprising an antioxidant that migrates into the gel by electrophoresis and that has a concentration sufficient to maintain proteins in a reduced state.

14. A discontinuous buffer gel electrophoresis system comprising:

an electrophoresis gel suitable for casting, the electrophoresis gel uniformly saturated with a gel buffer comprising an organic amine with a pK_a near neutrality and an acid, the gel buffer having a pH between 5.5 and 7.5; and

a cathode buffer comprising 3-(N-morpholino) propanesulfonic acid.

15. A discontinuous buffer gel electrophoresis system comprising:

an electrophoresis gel suitable for casting, the electrophoresis gel uniformly saturated with a gel buffer comprising an organic amine with a pK_a near neutrality and an acid, the gel buffer having a pH between 5.5 and 7.5; and

a cathode buffer comprising 2-(N-morpholino) ethanesulfonic acid.

16. A method for performing electrophoresis using a discontinuous buffer gel, the method comprising:

providing an electrophoresis gel suitable for casting;

uniformly saturating the electrophoresis gel uniformly with a gel buffer comprising an organic amine with a pK_a near neutrality and an acid, the gel buffer having a pH between 5.5 and 7.5; and

providing a cathode buffer comprising an antioxidant that is anionic at neutral pH in a

concentration sufficient to maintain proteins in a reduced state.

17. The method of claim 16, wherein the organic amine is Bis(2-hydroxyethyl) iminotris (hydroxymethyl) methane.

18. The method of claim 16, wherein the electrophoresis gel is a polyacrylamide gel.

19. The method of claim 16, wherein the acid is selected from the group consisting of hydrochloric acid and acetic acid.

20. The method of claim 16, wherein the gel buffer further comprises a dodecyl-sulfate salt.

21. The method of claim 20, wherein the dodecyl-sulfate salt is sodium dodecyl sulfate.

22. A method for performing electrophoresis using a discontinuous buffer gel, the method comprising:

providing an electrophoresis gel suitable for casting;

uniformly saturating the electrophoresis gel with a gel buffer comprising an organic amine with a pK_a near neutrality and an acid, the gel buffer having a pH between 5.5 and 7.5; and

providing a cathode buffer comprising an antioxidant that migrates into the gel by

electrophoresis and that has a concentration sufficient to maintain proteins in a reduced state.

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